

WHAT IS CLAIMED IS:

1. A communication method in which data is transferred from a second data processing apparatus on the sending side to a first data processing apparatus on the receiving side through a communication means, and in which, to make possible sending data from or receiving data into a memory region, said memory region is registered in the said communication means before the sending or receiving of the said data:

wherein, in a specific data transfer which is part of a specific data exchange, before the start of said specific data exchange, said first data processing apparatus registers a first memory region which is used to temporarily store received data from another data processing apparatus, said received data being later copied to the memory region that is the final destination of the specific data transfer; and

said first data processing apparatus communicates to said second data processing apparatus a transfer data length threshold, in accordance with which said second data processing apparatus selects one of a first transfer operation for transferring the data to said first memory region, which is already registered, and a second transfer operation that registers in said first data processing apparatus a second memory region which is the final destination of the specific data transfer and makes the second data processing apparatus transfer the said data to the said

second memory region.

2. A communication method according to claim 1, wherein the report of the threshold is carried out concurrently with the report of the address(es) of said first memory region from said first data processing apparatus to said second data processing apparatus.

3. A communication method according to claim 1, wherein the report of the threshold is carried out at the time of the start of the communication between said first data processing apparatus and said second data processing apparatus.

4. A communication method according to claim 1, wherein the report of the threshold is carried out at the first time that said first data processing apparatus communicates with said second data processing apparatus.

5. A communication method in which data is transferred from a second data processing apparatus on the sending side to a first data processing apparatus on the receiving side through a communication means, and in which, to make possible sending data from or receiving data into a memory region, said memory region is registered in the said communication means before the sending or receiving of the said data:

wherein, in a specific data transfer which is part of a specific data exchange, before the specific data exchange, said first data processing apparatus previously registers a first memory region which is

used to temporarily store received data from another data processing apparatus, said received data being later copied to the memory region that is the final destination of the specific data transfer;

said first data processing apparatus communicates to said second data processing apparatus a transfer data length threshold for the selection of the transfer operation; and

when the length of the data to be transferred does not exceed the threshold, said second data processing apparatus sends the data with said first memory region, which has been registered, as the destination; and

when the length of the data to be transferred exceeds the threshold, said second data processing apparatus request said first data processing apparatus to register a second memory region which is the final destination of the specific data transfer and sends the data with said second memory region as the destination.

6. A communication method in which data is transferred from a second data processing apparatus on the sending side to a first data processing apparatus on the receiving side through a communication means, and before the sending/reception of the data, and in which, to make possible sending data from or receiving data into a memory region, said memory region is registered in said communication means before the sending or receiving of the data,

wherein for a first period of time, said first data processing apparatus, on a specific data transfer, registers the memory region that is the final destination of this specific data transfer, and also notifies the said second data processing apparatus of the address(es) of said memory region;

the efficiency of said notification of the address(es) through the first period of time is measured; and

when the efficiency is smaller than a predetermined value, for a second period of time following the first period of time, the sending of the notification of address(es) is restrained.

7. A communication method according to claim 6, wherein the measurement of the said efficiency of the notification of the address(es) is carried out by measuring, during the first period of time, the ratio of the number of times in which the transfer data is transferred from said second data processing apparatus to the memory region that is the final destination of the specific data transfer in accordance with the notification, to the number of times said notifications of the address(es) is sent.

8. A communication method according to claim 6, wherein the efficiency of the notification of the address(es) is measured independently for every memory address.

9. A communication method according to claim 6,

wherein the efficiency of the notification of the address(es) is measured for all the addresses in the address notifications sent by said first data processing apparatus as a whole.

10. A communication method in which data is transferred from a second data processing apparatus on the sending side to a first data processing apparatus on the receiving side through a communication means, and in which, to make possible sending data from or receiving data into a memory region, said a memory region is registered in said communication means before the sending or receiving of the data,

wherein, in a specific data transfer in a specific data exchange, the data of the specific data transfer is copied to a first memory region, which is registered in said second data processing apparatus before the start of the specific data exchange;

said first data processing apparatus is notified of the address(es) and a data length(s) of the data thus copied; and

said first data processing apparatus, after having received the notification of the address(es) and the data length(s), when the data length(s) exceed a predetermined specific threshold, registers a second memory region for the reception of the data and reads out the data which has been copied to said first memory region of said second data processing apparatus onto said second memory region thus registered, while when

the data length does not exceed the threshold, reads out the data which has been copied to said first memory region of said second data processing apparatus onto a third memory region which is previously registered in said first data processing apparatus before the start of the specific data exchange.

11. A communication method in which data is transferred from a second data processing apparatus on the sending side to a first data processing apparatus on the receiving side through a communication means, and in which, to make possible sending data from or receiving data into a memory region, said memory region is registered in said communication means before the sending or receiving of the data:

wherein, in specific data transfer in a specific data exchange, the data of the specific data transfer is copied to a first memory region, which is registered in said second data processing apparatus before the start of the specific data exchange;

said second data processing apparatus sends the said data which has been copied to said first memory region, to a second memory region, which is registered in said first data processing apparatus, for said specific data transfer.

12. A communication method in which data is transferred from a second data processing apparatus on the receiving side to a first data processing apparatus on the receiving side through a communication means,

and in which, to make possible sending data from or receiving data into a memory region, said memory region is registered in said communication means before the sending or receiving of the data, said method comprising the steps of:

on a specific data transfer in a specific data exchange, registering a first memory region which is the source region of said specific data transfer in said second data processing apparatus;

notifying said first data processing apparatus of the address(es) of said first memory area; and

reading out the data in said first memory region by said first data processing apparatus onto a second memory region which was registered before the start of the specific data exchange.

13. A communication method in which a first data processing apparatus and a second data processing apparatus transfer data to each other through a communication means, and in which, to make possible sending data from or receiving data into a memory region, said memory region is registered in the said communication means before the sending or receiving of the said data, said method comprising the steps of:

optionally on said first and second data processing apparatus on a specific data transfer in a specific data exchange, temporarily storing data received from another data processing apparatus in a

first memory region and copying this received data thus stored into the memory region that in the final destination of specific data transfer;

optionally on said first and second data processing apparatus on the said specific data transfer in a specific data exchange, copying the data of the specific data transfer to a second memory area and sending the copied data to the other party of the communication; and

receiving the value of the transfer data length which is expected in the data exchange from the application at the source and/or destination of the communication, and/or from the other party of the communication.

14. A communication method according to claim 13, wherein when before the specific data exchange, said transfer data length is received and when the value of the said transfer data length is shorter than a predetermined value, said first and/or second memory region(s) is (are) allocated, registered and used.

15. A communication method according to claim 13, wherein when after having registered said first and/or second memory region(s), said transfer data length is received and when said transfer data length is equal to or longer than a predetermined value, the registration and the allocation of said first and/or second memory region(s) are released.

16. A communication method in which a specific



data processing apparatus sends/receives data to/from another data processing apparatus through a communication means, and in which, to make possible sending data from or receiving data into a memory region, said memory region is registered in the said communication means before the sending or receiving of the said data, said method comprising:

in said specific data processing apparatus, the on a specific data transfer in a specific data exchange, temporarily storing data received from another data processing apparatus in a first memory region which is registered before the specific data exchange and copying this data received to the memory region that is the final destination of the specific data transfer; and

measuring the utilization rate of said first memory region and when the utilization rate falls outside the range from a predetermined minimum up to a predetermined maximum, changing said first memory region.

17. A communication method according to claim 16, wherein when the utilization rate is smaller than the minimum, said specific data processing apparatus reduces the total size of the said first memory region, while when the activity ratio exceeds the maximum, increases the total size of said first memory region.

18. A communication method in which a specific data processing apparatus sends/receives data to/from

another data processing apparatus through a communication means, and in which, to make possible sending data from or receiving data into a memory region, said memory region is registered in the said communication means before the sending or receiving of the said data, said method comprising:

on a specific data transfer in a specific data exchange, copying the data of the specific data transfer to a second memory region, which is registered in said specific data processing apparatus before the start of the specific data exchange, and sending the copied data from said second memory region; and

measuring the utilization rate of said second memory region, and when the activity ratio falls outside the range from the predetermined minimum to the predetermined maximum, changing the said second memory area.

19. A communication method according to claim 18, wherein when the utilization rate is smaller than the minimum, said specific data processing apparatus reduces the total size of said second memory region, while when the activity ratio exceeds the maximum, increases the total size of said second memory region.

20. A communication method in which a specific data processing apparatus sends/receives data to/from another data processing apparatus through a communication means, and in which, to make possible sending data from or receiving data into a memory

region, said memory region is registered in the said communication means before the sending or receiving of the said data, said method comprising the steps of:

in said specific data processing apparatus, on a specific data transfer in a specific data exchange, temporarily storing data received from another data processing apparatus in a first memory region and copying this data received to the memory region that is the final destination of the specific data transfer, and copying data to be sent in the said specific data transfer from its original region to a second memory region and sending data thus copied to another data processing apparatus, both first and second memory regions being registered before the start of said data exchange, and

using said first memory region and said second memory region for receiving data and for sending data, respectively, to carry out the data exchange; and

measuring the utilization rate of both said first memory region and said second memory region, and when one of the utilization rates is high and the other is low, moving a part of the memory region between said first memory region and said second memory region.

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